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Bibliography

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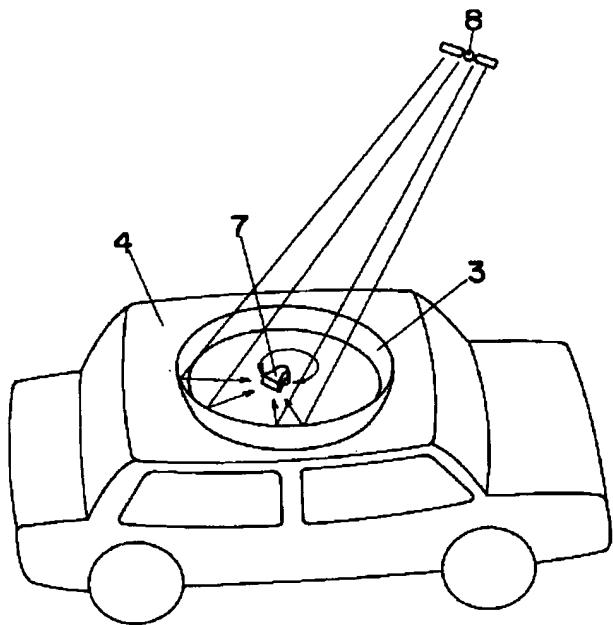
Epitome

(57) [Abstract]

[Objects of the Invention] Small and lightweight-ization are attained by low cost.

[Elements of the Invention] The reflecting plate 3 which is made to reflect the electric wave from a satellite 8, and brings an input signal together in one point of the inside is formed on the roof of the vehicle which is a mobile 4. The horn antenna 7 which is a miniaturized antenna in which rotation and vertical migration in the focal location of this reflecting plate 3 are free is arranged. The roll control of the horn antenna 7 is carried out in the direction in which the receiving level of a horn antenna 7 becomes high with migration of a mobile 4.

[Translation done.]



3 反射板
4 移動体
7 ホーンアンテナ
8 衛星

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CLAIMS

[Claim(s)]

[Claim 1] The automatic-tracking antenna which carries out [having formed the reflecting plate which make reflect the electric wave from a satellite and brings an input signal together in one point of the inside in the automatic-tracking antenna which is installed in a mobile, carries out migration tailing of the electric wave from a satellite

automatically, and received continuously, and having established the control means which arranges the miniaturized antenna in which rotation and vertical migration in the focal location of this reflecting plate are free, carries out the roll control of the miniaturized antenna, and receives the electric wave from a satellite continuously, and] as the description.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the automatic-tracking antenna for receiving the electric wave from a broadcasting satellite, when mobiles, such as a vehicle, are moving.

[0002]

[Description of the Prior Art] Conventionally, this kind of antenna controls an about 60x20cm flat antenna by two motors directly, and always receives the electric wave from a satellite by two, a horizontal angle and an elevation angle.

[0003]

[Problem(s) to be Solved by the Invention] By this method, during tailing, in order to need and do a big motor since it is always necessary to control the whole antenna in the direction of a satellite, and to drive a motor, a big powered live circuit is also required, and the motor sound was loud, and the sound sounded and there was the unpleasant sound by the part of roofs, such as a sight-seeing bus.

[0004] Moreover, there is no less than 50-60kg of weight, it needed to reinforce the roof section for installation, and needed to consider and redesign the structure of the whole car body, and there was a problem

that a crane etc. was required for the attachment itself and it could not install an automatic-tracking antenna easily. Recently, generally satellite broadcasting service (DBS) which broadcasts an electric wave from the geostationary satellite launched on the geostationary orbit of a satellite, especially the earth came to be performed.

[0005] As a general receiving method, an antenna is fixed to a residence in the direction of a satellite by the parabolic antenna or the flat antenna, and the electric wave from a satellite is received. However, the needs for the news nature of the broadcasting satellite itself to be high, and to receive the newest information in a mobile are increasing like CNN of the United States. For example, news and the need of saying that he wants to watch the game of baseball and relay broadcast of the information on real time are increasing in the ship, the train, or the sight-seeing bus.

[0006] This invention is offered in view of an above-mentioned point, and it is low cost and aims at offering a small and lightweight automatic-tracking antenna.

[0007]

[Means for Solving the Problem] This invention forms the reflecting plate which is made to reflect the electric wave from a satellite and brings an input signal together in one point of the inside, arranges the miniaturized antenna in which rotation and vertical migration in the focal location of this reflecting plate are free, and establishes the control means which carries out the roll control of the miniaturized antenna, and receives the electric wave from a satellite continuously in the automatic-tracking antenna which is installed in a mobile, carries out migration tailing of the electric wave from a satellite automatically, and was received continuously.

[0008]

[Function] It ** and the electric wave from a satellite can be continuously received by carrying out the roll control of the miniaturized antenna arranged in the focal location of a reflecting plate in a control means, and since the roll control of the miniaturized antenna arranged in the focal location of a reflecting plate is only carried out, small and lightweight-ization can be attained by low cost.

[0009]

[Example] Hereafter, the example of this invention is explained with reference to a drawing. Since the electric wave from the satellite which is far away turned into an almost parallel incident wave, it reflected by the spherical surface and electric waves gathered for the focus at one point as shown in drawing 3 , the parabolic antenna 1 installed the

miniaturized antenna 2 there, and it has adopted the approach of acquiring required gain.

[0010] On a mobile, as shown in drawing 4 , a part of spherical surface is used for a reflecting plate 3. And in order to employ the continuity of a horizontal plane efficiently, a reflector is formed so that 1 360-degree round may be taken a core [the focus of the spherical surface]. Even if the condition of having installed the reflecting plate 3 which carried out drawing 5 in this way, and was formed on the mobile 4 is shown, a mobile 4 rotates and a direction is reversed to a satellite, as shown in (b) from drawing 5 (a), it reflects in the 360-degree reflecting plate 3, and electric waves gather for one point.

[0011] Here, as a miniaturized antenna 2 installed in the focus of a reflecting plate 3, there are a horn antenna as shown in drawing 6 , and a flat antenna as shown in drawing 7 . In order to follow the electric wave from a satellite, as miniaturized antenna 2 the very thing is rotated and it is shown in drawing 6 (a), a waveguide 5 is made circular, the receptacle section 6 which supports this waveguide 5 to revolve is formed, and the rotation section is formed. Moreover, the circular waveguide 5 is received and it enables it to slide up and down to the section 6 for tailing of the direction of an elevation angle, as shown in drawing 6 (b).

[0012] In addition, when using a flat antenna as a miniaturized antenna 2, it is also the same as that of the case of drawing 6 . The general receiving-antenna section is divided as the tailing approach, phase contrast is detected to the reception output of each antenna, and there is the approach of controlling a motor (servo motor) and following according to it, using the ability to know the direction of the electric wave from a satellite.

[0013] However, since such an approach cannot be done in this invention, the approach of discovering peak value has been adopted as compared with the value before being able to shift the antenna itself a little merely and being able to shift it. That is, when a mobile moves as are shown in drawing 8 (a), and it is under reception normally and is shown in drawing 8 (b), after the beam inclined and all reflected waves have gathered for the horn antenna 7 as a miniaturized antenna 2, a beam can be shifted little by little right and left, and a horn antenna 7 is moved to the high place of gain.

[0014] As shown in drawing 9 (a), when having specifically received normally, it is in the condition A of not making a horn antenna 7 swaying right and left, and it is the maximum gain and gain is downed by B or C. When a mobile moves and it inclines, it comes to be shown in

drawing 9 (b), and as compared with an A point, a B point's gain is high, and C point is carrying out the gain down. In this case, migration control of the horn antenna 7 is carried out at a B point.

[0015] Drawing 1 installs the reflecting plate 3 which established the reflector in 360 degrees which cut the reflecting plate of a parabolic antenna into round slices on the roof of the vehicle as a mobile 4, installs the horn antenna 7 which receives the electric wave from a satellite 8 in the focal location of this reflecting plate 3, and makes the receive section of a horn antenna 7 free in a longitudinal direction and the vertical direction. Drawing 2 shows the whole block diagram and control of the longitudinal direction of a horn antenna 7 is controlled by CPU11 and the control section 10 which consists of A/D-converter 12 grades. The signal from a control section 10 drives a motor 14 through the motor drive circuit 13, rotates the gearing 15 which prepared in the output shaft of a motor 14, and carries out the roll control of the waveguide 5 of a horn antenna 7.

[0016] The signal is sent to the detection section 18, while carrying out the down mixer of the input signal at that time to the amplifier 16 of a microwave system in the local oscillation circuit section 17 at IF band and sending the signal to a tuner 19 and television 20. In the detection section 18, a signal is detected to DC and an analog signal is sent to A/D converter 12 of a control section 10. In A/D converter 12, the digital signal which carried out A/D conversion is inputted into CPU11. And CPU11 judges signal level, and it controls a motor 14 so that a horn antenna 7 turns to the one where gain is higher. In addition, a control means consists of a control section 10 and motor 14 grade.

[0017]

[Effect of the Invention] In the automatic-tracking antenna which this invention is installed in a mobile as mentioned above, carries out migration tailing of the electric wave from a satellite automatically, and was received continuously. The reflecting plate which is made to reflect the electric wave from a satellite and brings an input signal together in one point of the inside is formed. The miniaturized antenna in which rotation and vertical migration in the focal location of this reflecting plate are free is arranged. Since the control means which carries out the roll control of the miniaturized antenna, and receives the electric wave from a satellite continuously is established, the miniaturized antenna arranged in the focal location of a reflecting plate by carrying out a roll control in a control means. Since the roll control of the miniaturized antenna which can receive the electric wave from a satellite continuously and has been arranged in the focal

location of a reflecting plate is only carried out, it is low cost and small and the effectiveness that lightweight-ization can be attained are done so.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the condition of having installed this antenna of an example on the mobile in this invention.

[Drawing 2] It is the block diagram of the whole same as the above.

[Drawing 3] It is the explanatory view of a parabolic antenna same as the above.

[Drawing 4] It is an explanatory view at the time of using some parabolic antennas same as the above.

[Drawing 5] It is the explanatory view of the reflecting plate which established the reflector in the perimeter same as the above.

[Drawing 6] (a) and (b) are the perspective views and important section sectional views of a horn antenna same as the above.

[Drawing 7] (a) and (b) are the front views and important section sectional views of a flat antenna same as the above.

[Drawing 8] It is an explanatory view in the case of having arranged the miniaturized antenna in the focal location of a reflecting plate same as the above.

[Drawing 9] It is an explanatory view in the case of controlling a miniaturized antenna same as the above.

[Description of Notations]

2 Miniaturized Antenna

3 Reflecting Plate

4 Mobile

[Translation done.]

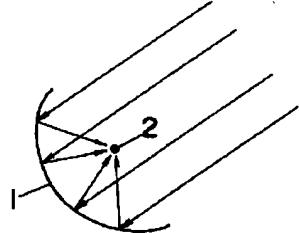
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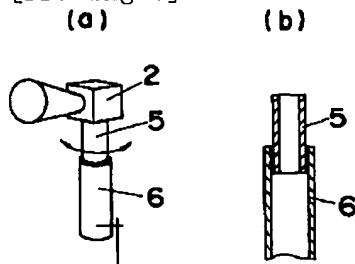
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DRAWINGS

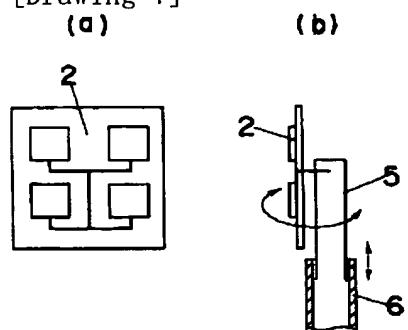
[Drawing 3]



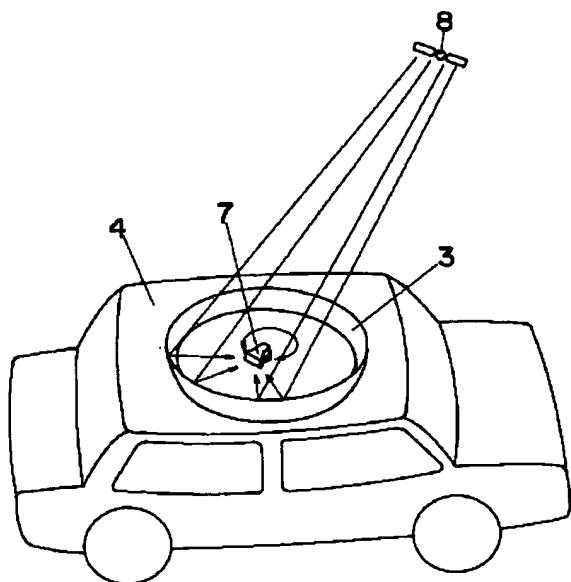
[Drawing 6]



[Drawing 7]

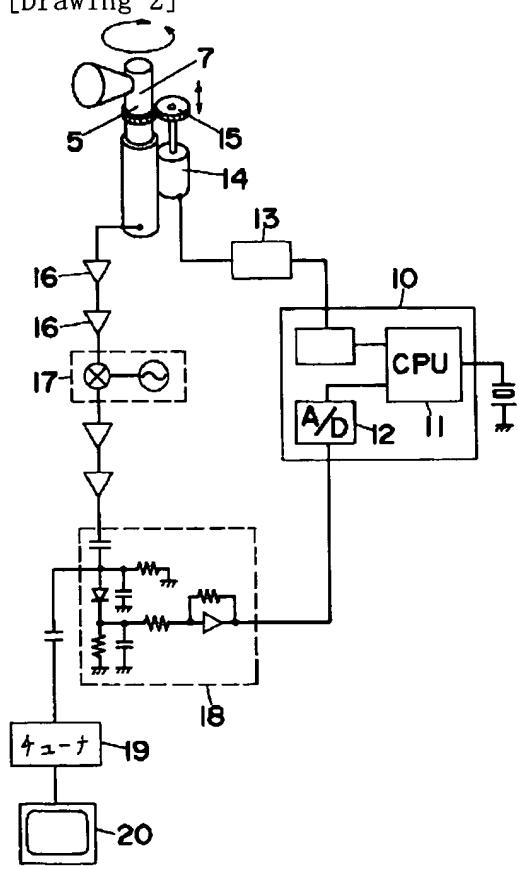


[Drawing 1]



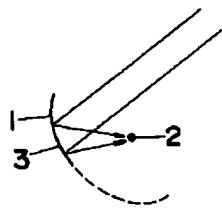
3 反射板
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[Drawing 2]

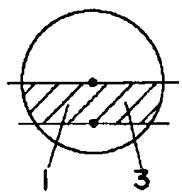


[Drawing 4]

(a)

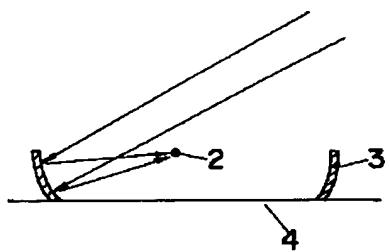


(b)

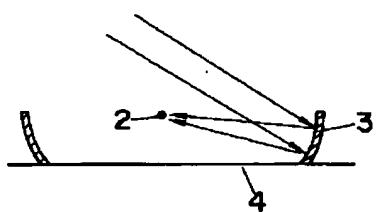


[Drawing 5]

(a)

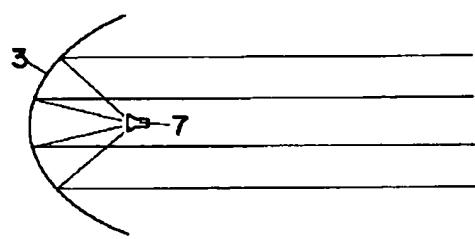


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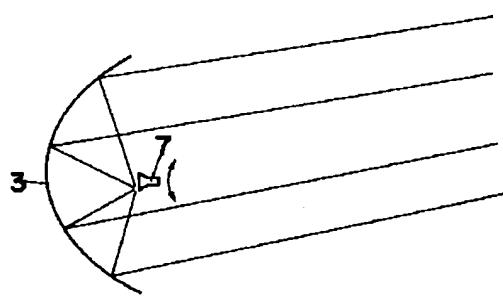


[Drawing 8]

(a)

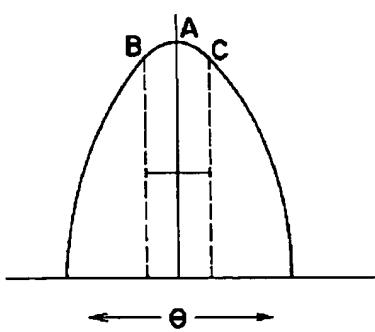


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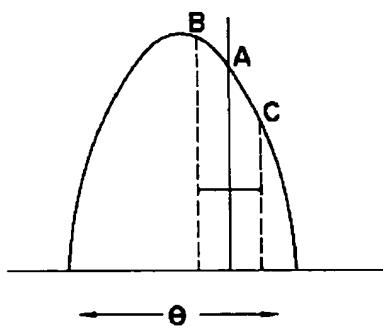


[Drawing 9]

(a)



(b)



[Translation done.]